



ABSTRACT

5 **PARTICULATE REINFORCED ALUMINUM-BASED COMPOSITES, THEIR**
 COMPONENTS AND THE NEAR NET SHAPE FORMING PROCESS OF
 THE COMPONENTS

10 This invention concerns particulate reinforced Al-based composites, and the
 near net shape forming process of their components. The average size of the
 reinforced particle in the invented composites is 0.1 - 3.5 μ m and the volume
 percentage is 10 - 40%, and a good interfacial bonding between the
 reinforced particulate and the matrix is formed with the reinforced particles
 uniformly distributed. The production method of its billet is to have the
15 reinforced particles and Al-base alloy powder receive variable-speed high-
 energy ball-milling in the balling drum. Then, with addition of a liquid
 surfactant, the ball-mill proceeds to carry on ball-milling. After the ball-milling,
 the produced composite powder undergoes cold isostatic pressing and the
 subsequent vacuum sintering or vacuum hot-pressing to be shaped into a hot
 compressed billet, which in turn undergoes semisolid thixotropic forming and
20 may be shaped into complex-shaped components. These components can be
 used in various fields. This product is featured with excellent property, good
 machinability, stable quality, component near net shape forming and cost
 effective and higher performance.

25 (Figure 5)